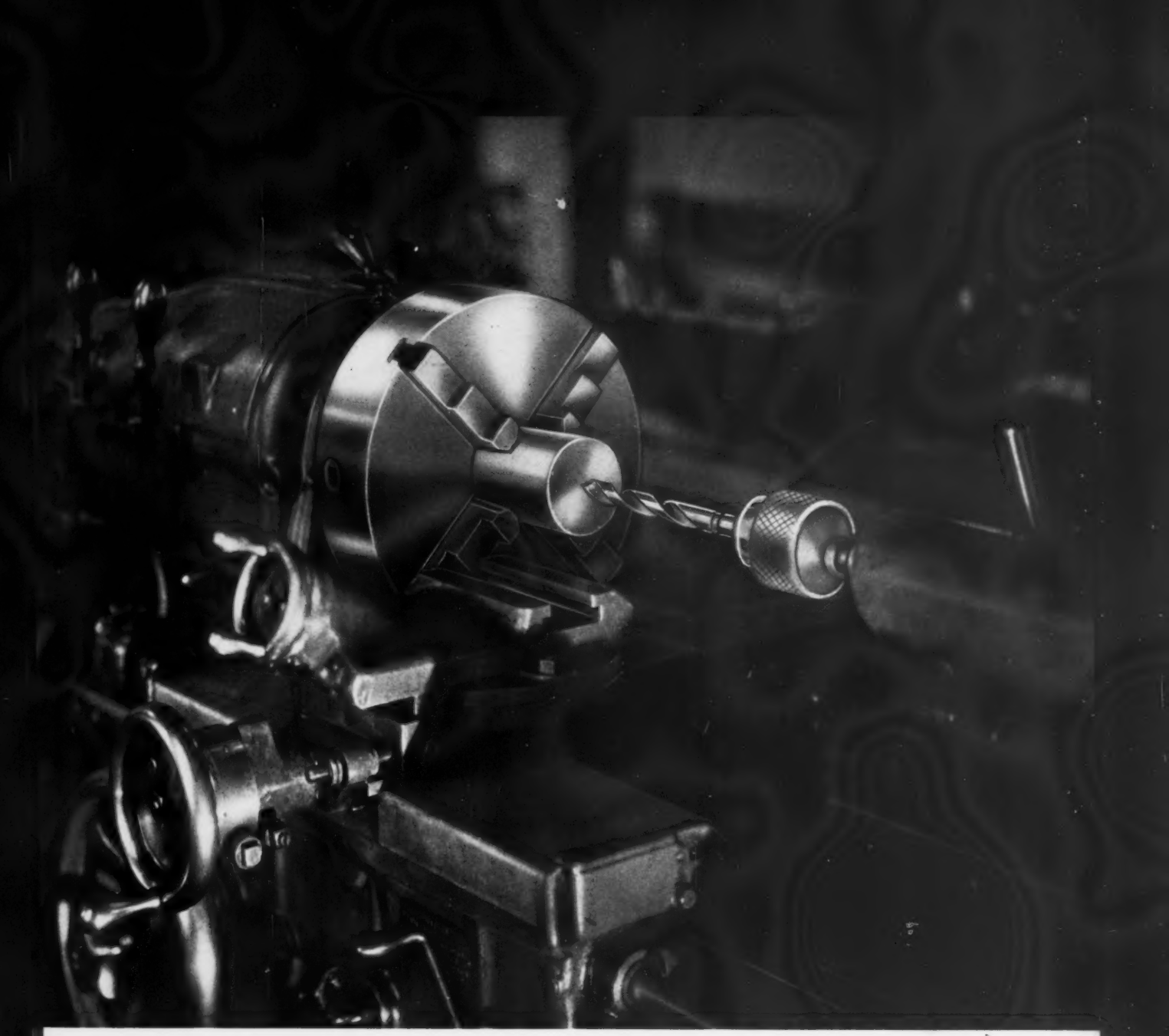


• Chuck Issue •

FOUR Jaw Lathe Chuck holding cylinder of metal while the Drill Chuck (Note the knurled sleeve) grips firmly the large drill as it turns out a hole in the center. These necessary aids to industry pictured above represent more than a century of development in Connecticut.

CONNECTICUT INDUSTRY

FEBRUARY 1935

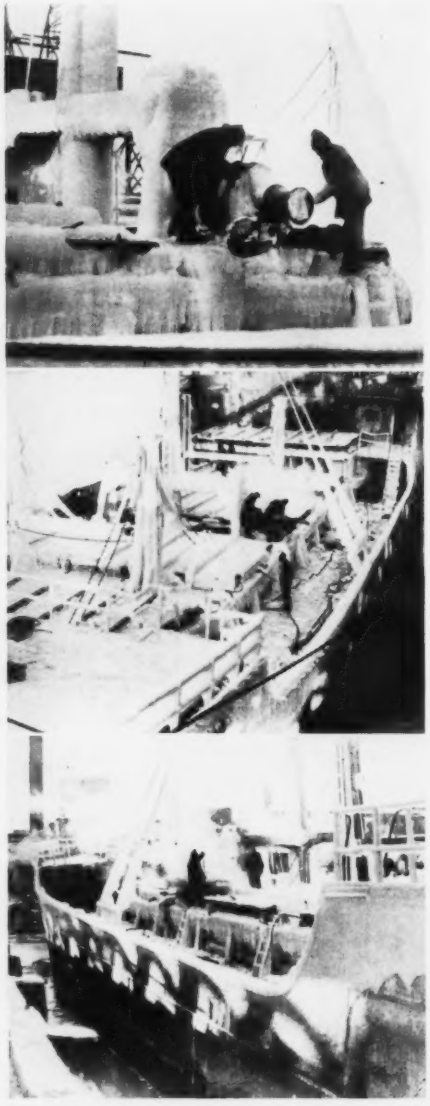
Bad Weather Won't Stop on Time Deliveries

As evidenced in no uncertain terms in the three "shots" of the S. S. "Coastwise", taken last winter as she steamed up to the T. A. D. Jones dock in New Haven —ON SCHEDULE—after one of her many trips from Norfolk, Va. laden with 6,200 tons of coal. . .

Good weather or bad, the T. A. D. Jones' fleet of coastwise steamers, its truck fleet, its barges, its rapid handling equipment at the docks and its well organized service arrangement with the "New Haven", is your guarantee of a constant fuel supply (coal or oil) within 24 to 36 hours of your plant.

* * *

YOUR FUEL WORRIES
ARE ENDED WHEN
YOU CALL



Views of the S. S. "Coastwise" at the T. A. D. Jones dock in New Haven during the rigorous weather of last winter.

T. A. D. JONES & COMPANY, INC.

DOCKS

NEW HAVEN BRIDGEPORT

NEW RIVER . . . NAVY STANDARD COAL . . . PENNSYLVANIA COAL

INDUSTRIAL FUEL OIL

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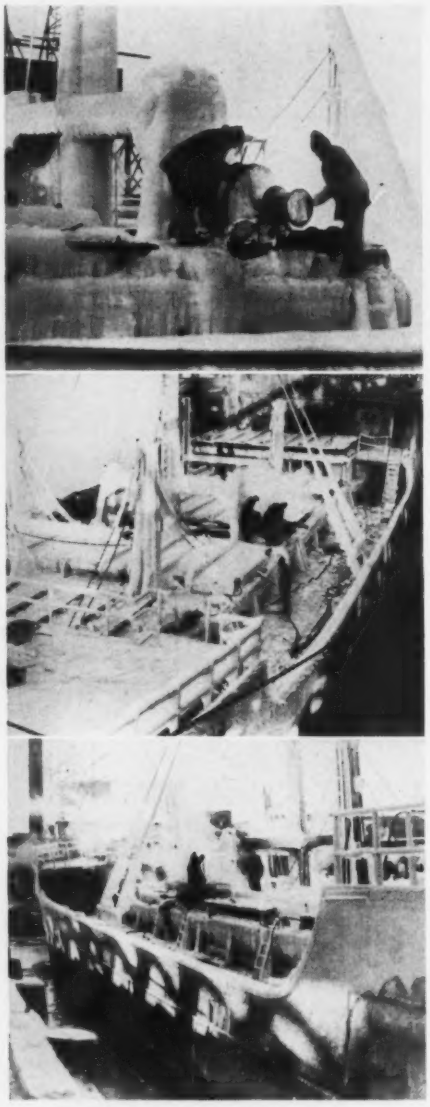

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CONNECTICUT INDUSTRY

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L. M. BINGHAM, Editor

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CASH FOR CARE

By E. KENT HUBBARD

The principle of the advisability of granting non-contributory old age pensions is quite as subject to debate as it was during the legislative sessions of 1931 and 1933. However, certain sections of the American people, swept on by the thinking of the times, will not debate—they will not question whether many pieces of legislation will do more harm than good to the great numbers of our citizens.

It is, therefore, incumbent upon those who still desire to do their own thinking, to counsel with those who do not, as to the form which old age pension legislation should take. They counsel, first, that we cannot substitute cash for care. There are many worthwhile citizens over 65 years of age who are unable to care for themselves. The mere payment of a monthly or weekly sum, however large, would not meet their problem. Consequently, we must still maintain institutions for the aged. The deplorable fact is that with the payment of pensions, our institutions are apt to become worse instead of better. Of the 35 almshouses in the state, there are not 10 which ought to be permitted to continue existence. Let those who would substitute cash for care investigate these conditions and bring them to the attention of authorities as the Manufacturers' Association attempted to do in 1931. Let there be pressure of the strongest sort exercised for a change of conditions as they are.

The group to which I refer must also counsel as to costs of the plans now being considered, for, if costs go beyond that which is reasonable and that which can be maintained, we shall increase the number of dependents rather than taking care of those who ought to be cared for.

In connection with proposed federal and state legislation, we hear talk of a cost of $500,000 a year. Space does not permit a thorough analysis of all bills nor of all of the features of any one bill, but the federal proposal would provide a non-contributory old age pension for those who are now too old to build up their own insurance. Let us see what that feature of the bill alone would cost the state of Connecticut. There are at least 93,000 people in the state of Connecticut 65 years or older. Of these, probably 14,000 would be eligible for the non-contributory pension. Since the bill provides for payment of $30 a month, the cost would be

(Continued on page 10)

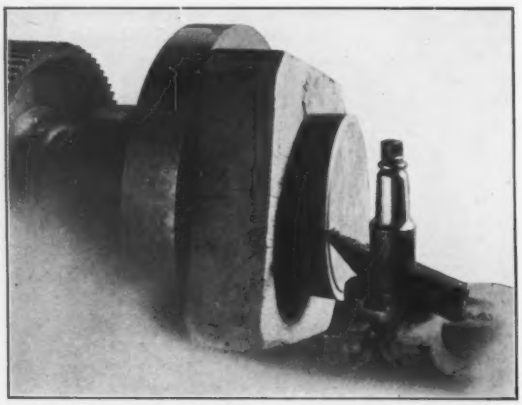
CHUCKS

By L. M. Bingham

Are not the surnames of animals which do a "hole in one shadow" in February. They are the "thumb and forefingers" of the lathe and other machine tools—the anchor of the tap, drill and other tools that are in the front row of the production line. Iron ore in a Stafford, Conn., swamp, plus a little ingenuity in making a better gadget to hold a piece of metal for a textile machine, resulted in that useful thing—the chuck.

Editor's Note. This story of the origin and development of the chuck industry is the tenth in a series of industrial articles designed to give authentic information about the Connecticut segments of American industries.

TO hold his prey, an animal has paws; man uses his hands occasionally for the same purpose but more often, since his brain began to hanker for civilization, they have been invaluable aids in accomplishing his daily tasks and pleasures. But the machine tool, maker of machines that makes consumer products, uses a **chuck** to hold its work while another **chuck** holds a co-worker—the drill, (drill chuck used only on certain machine tools) firmly as it performs a certain necessary task on the piece of metal held in position by the larger **chuck**. To be mathematically correct, a chuck is



Wood block attached to Face Plate of Lathe holding work in its recessed center.

to a machine tool as hands are to man and as paws and claws are to animals.

To find the earliest antecedent of a **chuck** (and antecedents are popular in this, Connecticut's Tercentenary year) we must shake a lot of dust from little used history books where we find the potter's wheel, most ancient aid to man in shaping his pottery by the throwing process. This great granddaddy of the modern Lathe Chuck was simply an upright shaft about the height of a low table, atop of which was a disk which could be revolved. The ancient potter or "thrower" dashed a lump of clay in the center of this revolving disk, squeezed it into a high conical lump then forced it down into a conical mass again to squeeze out air-bubbles. With his fingers he gave the moist whirling clay its first crude form, after which the interior was carefully shaped with a piece of horn, shell or wood. Set aside to dry partially, the vessel was again placed on the revolving wheel and "turned" to the desired thickness and shape.

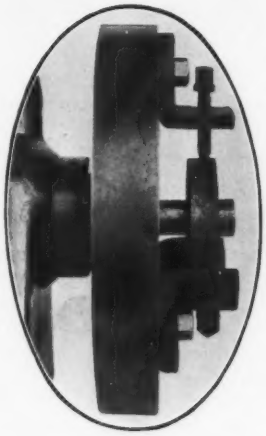
The principles of the early simple chucks were mere adaptations of the potter's wheel principle to metal working. The discovery that work in process could be held securely by means of simple screws or screw-dogs attached to a face plate, was the first step in the development of a chuck. Some Christmas tree holders utilize the same principle today, except that the tree is held securely by screws passing through a ring of iron rather than through heavy angle shaped iron fastened at one end by a bolt to the face plate of the machine tool.

Strange that the English mechanics should have overlooked the necessity of developing an adequate holder for work at the machine, leaving it to the early mechanics who shaped the cast bog iron ore in West Stafford, Conn., to discover. The deposits of this marsh iron ore were first uncovered in the town of Stafford, Conn. (about 22 miles east of Hartford, now on the shortest and best route to Boston), about 1800. Almost immediately thereafter, the town became a center for all types of cast iron work, and according to tradition many cannons were cast there for the War of 1812. Besides furnishing iron ore to that section of the country nature was also generous in its supply of power sources—the many sizable streams which flowed through the town. Harnessing this free power, many mills sprung up to manufacture the first crude machines used in the textile industry, then an infant in America.

In the production of these machines considerable lathe work was required. To hold the work in these lathes an oak block was screwed or bolted to the face plate of the lathe, the block turned to size and a recess made where gear blocks, pulleys or other work to be machined, were driven into the recess with a sledge hammer where they were held by friction while being turned by the lathe cutting tool.

This method of holding the work being unsatisfactory because it often fell out. Simon Fairman, a workman in the mills, addressed himself to the problem of finding a better method. The outcome of his experiments was the development of a crude Scroll Chuck, operated by revolving the scroll by

hand and in some cases by getting the final grip with a pin inserted in a hole in the scroll plate to give additional leverage. Fairman's chuck was a comparatively thin round plate of iron, on the opposite side of which he had cut a coarse spiral thread which in turn engaged bevelled teeth on the under side of each of four jaws placed in slots radiating from a central hole. As the plate or "scroll" was revolved, all jaws were moved forward or back concentrically to a desired position. Gear teeth on the lower surface of the scroll, when engaged by a pinion operated by a key, permitted the manipulation of the chuck's jaws to hold the work in a central position with the lathe spindle. Despite the passage of more than a century the mechanical principles of the Fairman chuck are still embodied in the majority of the best hand operated chucks.



Work held by Screw Dogs attached to Face Plate of Lathe.

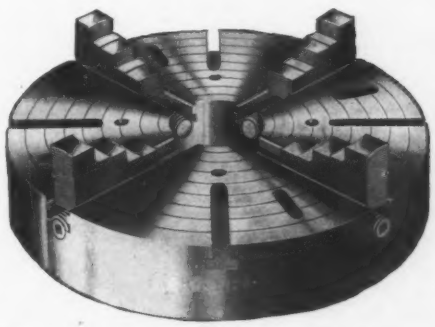
President Andrew Jackson signed, in 1830, the patent he received. Later these came into the possession of A. F. Cushman (founder of the Cushman Chuck Company) whose experiences will be discussed later in our story. This was the second signed paper Fairman had received at the hand of President Jackson, the first being a patent for a horseless steam carriage, which he never developed commercially.

This was the beginning of the era of mechanical development in America. The air reeked with the pollen of mechanical ideas which lodged in the most fertile mechanical minds. These were usually the ones engaged in some type of manufacture which was, of necessity, centered around the best natural water power sites and within easy access of raw materials. Thus the town of Stafford became one of the first cradles of American mechanical ingenuity, from which stepped forth practically all men who later founded the chuck manufacturing establishments of the United States. With more of pride than generosity they also gave of their knowledge to the Germans and the English who later used it to make their own chucks to a limited extent.

In this early setting we find working with Fairman in the mills an E. Horton, who later worked for Mr. Fairman for a time after he had established his own shop. Horton disagreed to some extent with Fairman's methods and finally withdrew to start his own shop in Windsor Locks, where he made a gear chuck (plant still in operation and known as E. Horton and Son Co., although the descendants of Mr. Horton are now out of the business, with the plant being operated by Mr. Joseph C. Regan). Fairman being of the inventive turn of mind more than commercial never, as far as the records indicate, commercialized his chuck. Rather, he chose to putter on inventions earning between flashes a livelihood.

Fairman had done quite enough to kindle the desire in other West Stafford workmen to develop the chuck business. What there was of Mr. Fairman's chuck business one of his sons-in-law, a Mr. J. R. Washburn, continued for a time until it interfered with a more congenial way to "pursue happiness" via the political route. But while Washburn made chucks, David E. Whiton and his brother Edward worked for him. Here and in their father's cooperage shop were born the ideas which later budded to form the foundation for the D. E. Whiton Machine Company, chuck and machine manufacturers of New London.

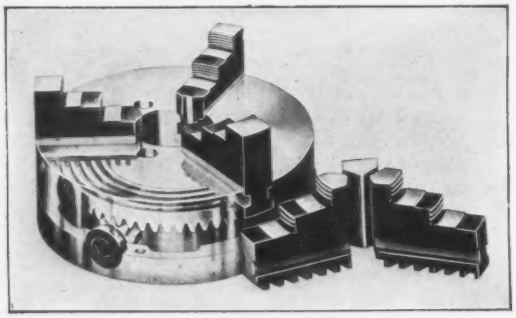
Together in 1856 David and Edward Whiton invented a centering machine and had just started to market it when the financial cyclone of 1857 laid them low for a time. But a tin peddler, looking for some extra money while covering his route, approached them in 1858 seeking the agency for their machines. Within a very short time this vendor of tin pans had built up a sizable business for the brothers. In 1865 what was left of the Washburn Chuck business was purchased and shortly thereafter David was granted a patent on an improved Scroll Chuck where the operating pinion was a part of the chuck wrench itself. Actually the patent was granted to Whiton on the chuck only, as Washburn had succeeded in establishing a prior claim on the wrench. Since neither was of any real value without the other both came into the hands of Whiton. More about the Whiton company under the brief historical sketch later on in the story.



The Four Jaw Independent Chuck, the first development from the Face Plate.

A Mr. Sweetland was a workman at the Horton Plant in Windsor Locks during the early chuck-making fever. Taking a live germ of an idea he patented a variation from the then accepted form of chuck, calling it the Sweetland chuck. He then approached the Hoggson and Pettis Company of New Haven in the late 70's which took over the manufacture of the chuck producing and selling it continuously until 1930 when the line was discontinued.

Still another workman in the Horton plant, a former carpenter, James N. Skinner, had the urge to improve upon the product which he worked with daily for nearly 16 years just before and after the Civil War. Like Sweetland his efforts at a new chuck design were rewarded with a patent. What to do with it at first he didn't know. Then he recalled his buddy of war days, Mr. Burgess, then a prominent official of the Russell and Erwin Company of New Britain, Connecticut. Mr. Burgess was at first enthusiastic over the possibilities of making the chuck but on further reflection decided that



Universal Chucks—geared scroll type with 2 sets of jaws.

its manufacture would take his company "out of its element" in the specialized hardware field. But the momentary disappointment was cushioned to Mr. Skinner by the suggestion that he take his invention to the Union Manufacturing Company which with its foundry and machine shop was ideally equipped to take on the new product. So, May 1, 1880, saw the Union Manufacturing Company of New Britain launched in the manufacture of chucks under the direction of Mr. Skinner. He not only supervised their manufacture but sold them by the actual demonstration method. Here was no single track mind. From carpenter to mechanic to inventor to foreman, then master salesman who booked enough orders in about 3 two-week trips each year, which with re-orders, kept the wheels of the chuck-making equipment turning. His other accomplishments will be told in the paragraph about the Skinner Chuck Company.

Out from Horton's, in Windsor Locks, or from Fairman's and subsequently Washburn's plant, in Stafford, went a number of other men determined to enjoy the freedom and to hazard the chance at greater reward from starting their own chuck factories. One drifted to Massachusetts, one to Oneida, New York, and one to Brooklyn. There were others too who went forth from Connecticut to establish themselves in the business of making chucks, but since this is the Connecticut chapter of the business, the story of developments elsewhere will be left to scribes from other states. Thus the gossamer thread of inventiveness, spun first by Fairman to give better hands to the lathe, grew stronger in Connecticut, and extended over its borders during the 75 years after 1830. The integrity and the progressiveness of the six Connecticut chuck makers is best described by the fact that these concerns are today producing and selling approximately 80% of the chucks used in the United States as well as being a large source of supply in foreign markets.

Mechanical Angles

To be technical is far removed from the writer's thoughts, ambitions, present capabilities. That the layman and the student may no longer think entirely of hairy animals that forecast blizzards by their shadows, of a piece of beef or of tossing an object when the word chuck is seen or heard, a non-technical explanation of the machine tool's first and most important aid to good work will be attempted.

Picture a round slab of iron or steel with a hole exactly in the center. The slab may be only a few inches in diameter and weigh a few pounds, or it may be as much as 60″ in diameter weighing as much as 2 tons. Into the metal are cut recesses—two, three or four depending on the type of chuck. Into the slots which extend from the outer rim to the center hole are fitted the metal jaws which resemble miniature steps. The under side of each jaw is formed to fit snugly into the jaw screw mechanism which, as it is turned by a chuck wrench, moves the jaws forward to engage the work and back to release it. If each jaw is operated by a separate screw, the chuck is known as a two, three or four jaw Independent Chuck, but if all jaws are operated together by merely applying the wrench to any one pinion, it is known as a "Universal" Chuck. If each jaw may be operated separately by its pinion or all jaws operated together as the "Universal" Chuck, it is known as the "Combination" Chuck. The step-like jaws are usually made of two pieces of iron or steel fastened together by heavy screws and dowels, thus approaching as nearly as possible jaws made of solid steel. Nor is the body of the chuck always machined out from a solid piece of steel. This would be impossible in the case of the Universal or Combination type chucks which have scroll gearing and which actuate all pinions when only one is turned.

There are many types of chucks of the hand variety, with and without ball bearings, as well as the automatic air and electrically operated chucks, used principally in high speed production operations where the work to be done on each piece requires brief operation of the machine, thus making the time of adjusting the chuck jaws a material factor in the cost of the work. With the automatic type air chuck, jaws are opened and closed instantly with the turn of an air valve and with the pressing of a button in the case of the electrically operated chuck. Not over 3 to 4 seconds are required to release one small piece of work and insert another with either of the two automatic chuck types.

Besides the chucks already mentioned for use on centering and chucking machines, grinders, ordinary and turret lathes, chucks are also made for planers, boring mills, grinding and milling machines. Some have a square base, others round and still others are square operating on a swivel base to permit speedier manipulation of the work on

planers. The latter are of the two jaw type resembling a vise. Simplified and modified the square base type is called a "Drill Press" Vise or a "Milling Machine" Vise.

In short, the maker of chucks to hold work while it is being machined, has had to develop chucks that are best suited to the many tasks demanded and he has had to perform it within the limits set by the machine tool designers. The ideal chuck would be one which possessed the rigidity of solid steel, at the same time having the adaptability of the human hand to grasp objects of various sizes and shapes, and hold them firmly. Although this ideal is impossible to attain, all of the higher grade chucks of today are made with these principles in mind. Retaining old principles learned by the earliest chuck makers, the producers of modern chucks have made countless improvements in design and construction in order that they might keep pace with the rapidly increasing demands for greater gripping power, made necessary by the tremendous increase in the use of high speed steel. It has been machined in a wider variety of shapes and larger sizes during the past 25 years than ever dreamed of prior to the 20th century. As might not be suspected by the men unacquainted with machine shop practice, the chuck is distinctly a precision instrument, which in many instances must be built so that work protruding from the jaws, when in motion, will not be "out of true" in excess of .002".

Production Processes

The construction of such precision work requires the use of modern machine shop equipment including lathes, shapers, grinders, drills, boring mills, planers as well as many special high speed gear cutting machines and polishers. Modern tempering methods including electric furnaces are also employed. Following the completion of the various parts entering into the construction of a given lot of either standard or special chucks, they are assembled, each jaw in its own place and then rigidly inspected for flaws. Precision measuring instruments and an actual test of the chuck under work conditions is made before it is carefully boxed ready for shipment.

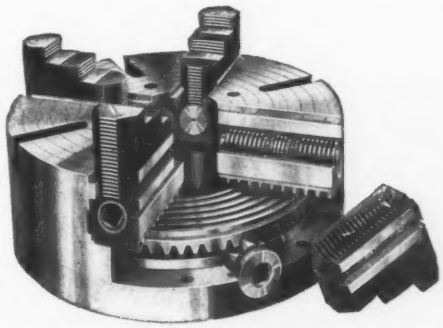
The Drill Chuck

The Drill Chuck differs from those just described in that they are made to hold tools (reamers, taps and drills) instead of work being machined. Like the Lathe Chucks, Drill Chucks are made in a wide variety of sizes and styles to accommodate the smallest type of electric drill up to the largest drills, taps and reamers and other tools. The appearance of the Drill Chuck differs entirely from the lathe type chuck. It more nearly resembles the nose and first few inches of a small artillery shell, with three small jaws protruding at the lower point similar to those in a carpenter's brace. The rounded outer sleeve of the chuck is usually knurled metal with a taper opening in the top for the arbor. The other end of the arbor is tapered to fit into the socket of the machine spindle. After the arbor has been tightened at the spindle and in the top of the chuck, and the tool gripped firmly in the jaws by tightening them with a key-like wrench, the machine is ready for operation. The principle of construction of the two types is quite similar since the grip and release in both cases is controlled by geared pinions operated by a wrench or key. There are keyless or self-tightening chucks, too, which are equipped with ball bearings. This type is designed especially for portable drill use but in some cases is also used in machine drilling. The tool automatically tightens in the keyless type with each increase in the load, but is easily released by a slight twist of the sleeve.

Care of Chucks

While chucks are built to last for a number of years, especially those made of steel, they will not go on indefinitely giving service at 100% efficiency if they are not properly treated. For instance, the Lathe Chuck should never be used to hold a piece of work larger than its own diameter. It is likely to throw it out of true. It should never be dropped nor should a poorly fitted wrench be used because of its tendency to round over the corners of the wrench and enlarge the holes in the jaw screw. Power should never be turned on until the spindle with the chuck and work on it is revolved slowly by hand to make certain that no collision will occur with the lathe carriage.

Both Lathe and Drill Chucks should always be kept clean and well oiled as they are simply mechanical appliances subject to damage from dirt and rust just as other tools. If the threads of the Drill Chuck are injured even slightly the drill may run out of true as much as .010", turning out poor work which will in the end cost many times the price of a new chuck. While the heavier Lathe



Combination Chuck—geared scroll type cut open to show working parts.

Chuck will stand greater strains, it too will cost many times its replacement value in poor work if it is not in condition to turn the work true within very narrow limits.

Cooperation in the Industry

Like most industries, during the early periods of development, there was some bitterness caused by patent infringements and unethical trade practices. For several years during the early part of the century, a Connecticut manufacturer of Drill Chucks

and another from a nearby state fought each other both in the courts and through paid advertising in trade papers (particularly the American Machinist). It was a case of the out-of-state company imitating the Connecticut company's patented product, the former claiming that it had the right to make that kind of chuck because the idea had been patented years before and had run out. The Connecticut company, in combination with its suit against the imitator, bought a number of two page spreads in the American Machinist to tell the complete story of its invention and to take issue on every claim of its competitor, also stated oft-times in the previous issue of the same publication. How odd such a controversy seems today, because no such direct argument would be accepted as advertising copy by trade papers!

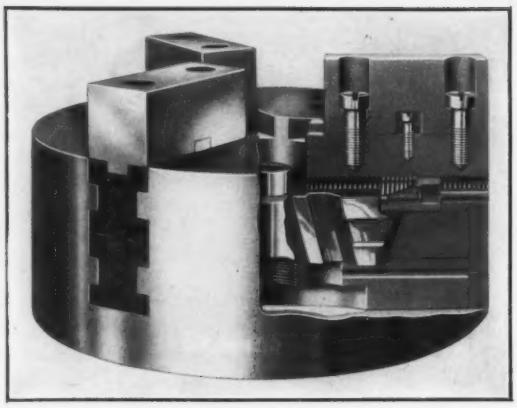
Today, it would probably be impossible to find an industry where cooperation and good feeling exists to a greater degree. That condition, which was exampled in 1930 by a cooperative advertising campaign to encourage chuck replacements, is the more remarkable in lieu of the extreme scarcity of new and replacement business since 1929. Within the past few months some improvement has taken place in the industry, and most Connecticut members are today more optimistic than they have been in the past five years. Once production starts in earnest for the capital goods market, the chuck business must be swept along with it to higher brackets of activity.

The Union Mfg. Co.

This company, as the name implies, was the union in 1866 of several businesses previously existing, being organized to provide a grey iron foundry and machine shop which would do work for all concerns represented in the directorate (38 stockholders representing practically every plant then in New Britain) as well as manufacture for the outside market. Among the prominent stockholders of this $100,000 company were: H. R. Russell, C. B. Erwin and Horace Eddy of Russell and Erwin Hardware Company and Dr. T. Woodruff and Mahlon Woodruff, both of whom were later officers of the same company.

Companies which were included in this union were: James Y. Smith Mfg. Co. (cast iron butt business) and the Union Butt Co., both of Providence; and the local machine shop of A. H. Merriman, then employing 10 to 12 men. Since its original organization three additional companies or branches have been acquired, one the Somerset Stove foundry, in 1920; another the Derby Plane Co., of Derby, in 1900; (carpenters' planes) and the third, the chain hoist business of the Franklin Moore Co., of Winsted, in 1927.

One line which the Union Mfg. Co. has continued to make from the beginning is grey iron castings, both large and small. Although the company produces castings of practically all types, having cast the ones for the first cars of the Union Pacific railroad, it has specialized for more than 40 years in the production of castings for typewriters, small tools, hardware, light and medium machinery. Among the early typewriter companies for which



Three Jaw air operated Power Chuck, cut open to show working parts.

it made castings were the Yost, New Century, Densmore, Hammond and several others. In the early 70's the company was induced to make a pump patented by a Middletown man, and shortly afterwards decided to make a full line of house and yard pumps.

The next chronological development was in the manufacture of chucks, brought to their attention as previously related, by James N. Skinner, the inventor and a former workman in the E. Horton & Son Co. in Windsor Locks, Conn. The chuck business was continued after 1887 (year Mr. Skinner left to start his own company) under the direction of J. W. Carleton, A. W. Hadley and others. Today it is said to produce a wider variety of chucks, both lathe and drill types, than any other producer in this country or abroad. Included in its line are power chucks which may be operated either electrically or with air.

In 1905 when G. W. Corbin became president of the company, it was decided to concentrate on the production of two items—chucks and castings, which with the addition of the chain hoist business in 1927 constitute the company's full line of products manufactured today. Because of the poor outlook for the sale of pumps, that portion of the business was sold to W. & B. Douglas of Middletown, in 1907. The manufacture of cast iron butts was also discontinued at about the same time, due to the introduction of the steel butt.

Starting with a capital of $100,000, in 1866, th company has grown and expanded its capital structure through earnings until today it stands at $1,000,000. During the terms of presidents G. W. Corbin (1905-1908) and A. F. Corbin (1909-1929) the old buildings were replaced and the plant enlarged and re-equipped.

Present officers of the company are Carl S. Neumann, president; H. H. Wheeler, treasurer, and C. S. Mueller, secretary.

The Cushman Chuck Co.

Simon Fairman, father of the first chuck (in 1830) worthy of the name had at least two daughters. One married J. R. Washburn, who continued

Fairman's business long enough to educate several workmen sufficiently in the art of chuck making, so that they entered business for themselves. Another daughter married A. F. Cushman, an excellent mechanic, a good merchandiser and (as later developed) a good investor.

Mr. Cushman's first venture in the Chuck business was in 1862 in a bedroom of his home on the corner of Church and Spring Streets, Hartford. Here, with the aid of a foot and hand power lathe, he would make one or two dozen small Geared Chucks, with adaptations of and general improvements on the general plan of his father-in-law, Fairman. These he placed in a sack and went to New York where he easily disposed of them to dealers. By 1870 his small successes permitted him to move into a power building and later into a sizeable factory of his own on Cushman Street, Hartford. On this factory he placed a large sign with the name Cushman Chuck Co. on it, where it could be seen by passengers on the New York, New Haven and Hartford Railroad. This same sign, which doubtless has excited the curiosity of many a non-mechanical traveler as he passed the plant, is still in service and in plain view of the rail traveler, even though it has been moved (in 1914) to a much larger and more modern structure on Windsor Street.

Mr. Cushman knew men, at least so far as his own purpose was concerned. He picked Adrian P. Sloan, a farmer boy from Tolland, Conn., who had learned the machinist's trade at the Colts Patent Firearms Mfg. Co. Young Sloan worked a short time for Mr. Cushman, then enlisted and served in the Union Army in 1863 and 1864. Returning to Hartford at the close of the war, he became Superintendent, Works Manager, Chief Designer, and in fact, as Mr. Cushman gradually lost the use of both eyes, it was necessary for Mr. Sloan to carry the responsibility of the entire mechanical end of the business.

In 1885 the company was incorporated with A. F. Cushman as president and his son, Eugene, secretary and treasurer. Eugene succeeded his father as president after the father's death in 1914 remaining until his death in 1919. Richard, son of Eugene Cushman, then succeeded to the presidency, but in 1923 resigned in favor of A. P. Sloan, who with the assistance of his son Harry E. Sloan, continued at the head of the business until 1928 when he resigned to become Chairman of the Board of Directors. Harry E. Sloan was then made president and still continues in that position.

As to product, the Cushman Company specializes on the lathe type of Chuck in a wide variety of styles, some of which were referred to in the general portion of the story. Like other makers of quality chucks, the Cushman line has kept pace with the rapid development of machine tools on which the chucks are used. Probably the most noted of the Cushman Chucks is the so-called "Incomparable" line of 4 Jaw Independent Chucks equipped with a very efficient type of thrust bearing, first introduced in 1920. Within the past few years, a Cushman engineer designed a new type "Combination" Chuck which is now known as the Tri-plex.

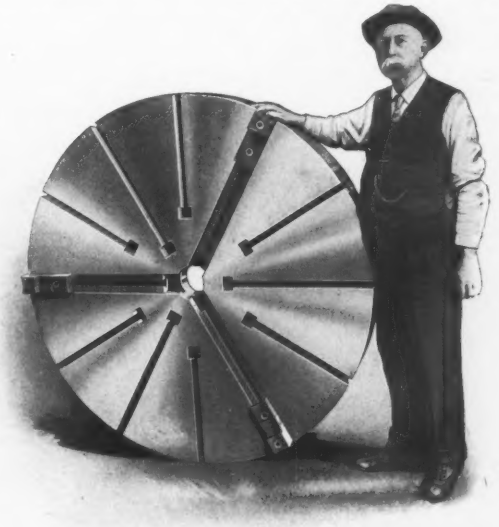
Although the company has to its credit many other developments which cannot be mentioned here, because of space limitations, the new Cushmatic electrically operated power chuck is one of its latest and most important. The company has also recently developed a New Straight Line Unit for applied power called a Pull-Push Power, which is recommended for operating power clamps of shear and welding machines for molding presses, for vises, clamping fixtures and jacks, for opening and closing industrial doors and switches.

At the very start of the business, Mr. Cushman looked beyond home markets and from 1870 on for a number of years, a large percentage of the Chucks used in England were made by A. F. Cushman, or his successor. In France, chucks were taken to the shops, mounted on lathes and workmen taught to use them by Mr. Cushman's representatives. In a similar way, Cushman Chucks were sold in quantities in Germany, Russia and in Norway and Sweden. The Germans liked them so well that they came to the Cushman shop at Hartford to see how they were made. Returning to Germany, they started to make what they called "Cushman's." Technically, this method of holding work, was in Germany called the "Cushman System."

Foreign business has also come from China, Japan, India, Straits Settlements, Australia and New Zealand. For many years this foreign business accounted for 50 percent of the Cushman output. During the World War, foreign countries were brought to realize as never before, their dependence upon the products of the Cushman Company as well as those of all other American Chuck manufacturers who were called upon to furnish practically all of the Chucks for the Allies, as well as to care for the unusually large domestic requirements.

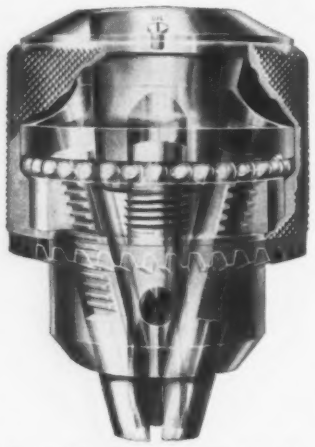
The Skinner Chuck Company

Besides inventing and producing chucks, James N. Skinner, who started the Union Manufacturing



A 60" diameter Chuck, weighing 2 tons, for holding work on a giant boring mill.

company in the production of chucks, was intensely interested in the future welfare of his son. Even at the age of 8, this lad (now E. J. Skinner, Chairman of the Board of Directors of the Skinner Chuck Company), was taken by his father to the Horton Plant to watch the workmen and machines. Later on after he had completed his commercial education in New Britain, he became associated as bookkeeper with Rogers and Company of New Britain. After he had become thoroughly initiated into practical business affairs, he and his father counseled together (as they had been in the habit of doing since his early boyhood days), finally deciding that their own best interests were to be obtained through starting their own shop. Their capital being too small, financial assistance was secured from D. M. Rogers, D. O. Rogers and David Camp (father-in-law of D. O. Rogers, uncle of Walter Camp and



A Drill Chuck—ball bearing type with interior parts showing.

a well known educator who was also very successful in financial investments made largely in New Britain industries).

The company was therefore organized by these men, James N. Skinner and his son E. J. Skinner on May 1, 1887. For a number of years the company experienced financial difficulty operating on their small capital of $8,000, and paid no dividends. But despite all discouragement, the backers of the company continued to have faith, which was not misplaced, as evidenced by the fact that the present capital is $500,000, all taken from earnings.

The Skinner Company developments have kept pace with the new designs in machine tools, and now produce, a complete line of Lathe and Planer Chucks, Face Plate Jaws, "Wrenchless" Power Chucks operated by compressed air, and up until quite recently, Drill Chucks. The company has also done considerable business in the manufacture and sale of its patented air valves which may be used in many other types of installations besides the operation of its own "Wrenchless" Chuck. It also produces Vises, both hand and power types, and still more recently, it started to manufacture a line of piston rings, called "Gold Seal" for the automotive trade, industrial and marine gasoline engines, and for Diesel Engines. It is known as "The Ring With A Bearing," since bands of anti-friction bearing metal are inserted around the entire circumference of the cast iron ring, projecting slightly beyond the ring. One of the many sales points for this type of ring is the fact that it may be installed, for instance, in a bus motor and immediately put into service without previous "running-in" because the softer bearing metal will not injure the cyinder walls. Space will not permit of a general description of the diversified line of Skinner Chucks, but a number of them have been previously mentioned in the general section of this article. Today the company supplies a large number of chucks as standard equipment on the machine tools of prominent manufacturers, disposing of the remainder of its production to mill supply houses throughout the United States and some foreign countries.

The present officers of the company are: Paul K. Rogers, president and treasurer; A. E. Thornton, assistant treasurer; R. B. Skinner, secretary; E. J. Skinner, chairman; James M. Skinner, grandson of the founder, superintendent and production manager.

Jacobs Manufacturing Company

Arthur I. Jacobs was a consulting engineer who had been connected with the Pope Manufacturing Company, and the Smythe Manufacturing Company, both of Hartford, and with the American Optical Company of Southbridge, Mass. For these concerns he had made many developments prior to 1900, most notably those on spokes and eye glasses. Noting what he considered certain deficiencies in drill chuck design, he invented a new type Chuck on which he was granted a patent on September 16, 1902. It was first demonstrated to the Sigourney Tool Company, several months prior to the granting of the patent, and an order received for 500 chucks. It has since been known as "The Jacobs Drill Chuck with Toothed Sleeve and Key," but more recently is referred to as the "Jacobs Improved Drill Chuck."

Being an engineer rather than a manufacturer, Mr. Jacobs attempted to interest several manufacturers of chucks in his new invention, but failing to do so, started to produce his product in the factory of the Pope Manufacturing Company in 1902. The product was a phenomenal success and was accepted by the trade within 6 to 8 weeks after its introduction.

Larger quarters and additional capital being necessary to care for the demands made by dealers, the Jacobs Manufacturing Company was organized October 30, 1903, with Arthur I. Jacobs as President and Raymond D. Jacobs, Secretary. Factory space was leased on Pearl Street and retained until 1906 when larger quarters were secured at 32 Union Place, Hartford. In 1916 a new factory was built on Park Street near Prospect Avenue, which has since housed the company's ever-increasing business.

Manufacturing drill chucks, exclusively, the Jacobs Manufacturing Company is unquestionably the largest producer of drill chucks in the United

(Continued on page 19)

PROFITS AND LEADERSHIP

By HENRY H. HEIMANN

Executive Manager, Sec., and Treas., National Association of Credit Men

The writer of this article is a well known authority on money and credit. On November 8, his talk on "Government and Sound Money" was well received by a group of approximately 100 Connecticut credit men, accountants and manufacturers. Within this article, Mr. Heimann discloses facts equally as interesting as those brought out so forcibly in his recent address.

RECENTLY, when I visited a Southern farm which I have been unsuccessfully trying to operate for about fifteen years, I found my tenant grubbing a fruit tree. True, the tree did not look very healthy. Its gnarled trunk, twisted branches and miniature leaves bore evidence of a depression in Nature. But I was interested to know why the tree was being grubbed. The tenant informed me that he had watched the tree for four years, had taken good care of it, but for some reason or other it bore no fruit. The tree, he concluded, was sterile.

Being a good tenant he did not want any trees in the orchard that bore no fruit. If he desired a shade tree he would not plant it in the center of an orchard, nor would he plant a fruit tree on the front lawn.

This illustrates the natural law of earnings or profits. Both man and nature expect returns. When profits and earnings are not forthcoming, either by way of fruit, crops or beauty, little patience is exercised either by man or nature.

More recently, profits have been challenged. The ridiculousness of a challenge to fair earnings, or to the principle of fair earnings, in business is self-evident. It is obvious that the very progress of civilization depends upon earnings; that the profit motive far from being a selfish one is the most progressive motive in civilization.

Take a view of the number of our universities, understand the extensiveness of our libraries, realize the tremendous scientific-research program in our various institutions, consider the movement for the improvement of health, in fact, survey every advancement in this nation, and you can trace it directly to profits. Profits are what made it possible. Without profits a nation soon would fall into decay.

Visual evidence of non-profit making nations is found in the barbaric countries, where life is in its primitive stage and where civilization as we understand it is unknown.

Since profits are so essential, it might be well to measure the extent to which they are desirable. It is, perhaps, just as uneconomic to expect excess profits or to develop excess profits as it is to expect to continue the operation of a business without any satisfactory return upon the money actually invested in a business.

The years ahead will insure earnings to the well conducted and efficiently managed business. No one will question this. The extent of possible profits in the years ahead, however, is what every one is asking.

The answer might be tersely stated by saying that the earnings will and must be a fair return upon the money actually invested. A fair business return has generally been considered from ten to twelve per cent, allowing dividend return of six per cent, the balance being needed for protection against unprofitable years and unforeseen contingencies.

It is when we consider invested capital that we find considerable variance of views. Certainly, many business institutions which, during the insane days of 1926 through 1929, increased their capital structure through the near-fiat method of printing non-par value shares and then capitalized these shares in a market operation, will find it difficult to make a return on peak values established for those shares during the periods of wild speculations.

The values established for those shares were fundamentally unsound. If a man can run 100 yards in ten seconds, it does not follow that he will run a mile in less than three minutes. We all know that a dash man could not keep up the speed he displays in a one hundred yard dash for a mile. Many industrialists looked at their earnings for the years 1926-1929 and immediately concluded there would be a continued expansion or, at least, a maintenance of those earnings for a longer period of time. They should have known better but they didn't. Instead they were taken away with the doctrine of "the New Era," and other false economic philosophies.

An examination of the balance sheet of one manufacturing company, for instance, disclosed in 1929 that the actual cash invested per share in that company was $4.25. The stock was selling in the market at $50 per share!

Any one will tell you that it is unreasonable to suppose that you can invest $4.25 in any business and expect to make a return on an investment of $50. It simply cannot be done for long. If it could be done, there would be an overproduction the like of which the world has never seen, because everybody would be rushing to get into the manufacturing business.

This capitalization was largely developed through the issuance of non-par value shares, with a declared value of $1 each. If this business had been a business based upon new basic patents, under which the potential earnings were tremendous, or upon other similar factors, the record might have been made. However, we are now speaking of an average business, and that is what this manufacturing concern represented. In all probability, in the years ahead this business will make a return of approximately 12% on about $4.50. These are sound earn-

ings. Business has no right to complain about earnings of that character.

Of course, the logical thing for this business to do would be to reduce the number of shares outstanding to reflect more nearly sane values in its certificates, and to be in a position, by reduction of the outstanding shares, to distribute earnings of more than a few cents a share.

Earnings will be less in the years ahead than they were in the days of 1926-1929 but their resumption will be followed by a continued improvement until they reach a peak where once again through excesses we fall into another period of recession. That continued improvement should carry for a number of years. Indeed earnings might improve very rapidly were it not for the fact that they will be impeded in the future years by heavy taxation, by increased costs of doing business arising out of social legislation, and with other pending burdens.

Thus it behooves every manufacturer or industrialist to use diligence in conserving his assets. There should be less effort for mere sales volume and more effort for a profitable distribution. Credit should be carefully analyzed, for the bad debt waste in this nation resulting from a lack of proper analyzation of credit, in itself, represents a staggering sum. Many people have estimated it as high as one billion dollars a year. It is a waste that can and should be reduced. It is a waste, may I say, that must and will be reduced.

The approach to the salary problem has been rather unique by the administration. Salaries, of course, are a part of cost, and there can be no specific rule enunciated that will govern salaries. Some men may be cheap at $100,000 a year, others are high-priced at $5,000 a year.

The only sound basis of salary is efficiency. Merely because a business is large is no justification for unusually large salaries. The answer lies in how the management of that particular business, in comparison to other businesses in the industry, performed. If a man is at the head of an organization that, let us say, has a capitalization of fifty millions of dollars and his company, during these years, fails to make an improved showing over the general run of companies in his industry, the management of such organization should be on a nominal salary. In fact it deserves dismissal unless there are clearly extenuating circumstances. In this instance the management fails to demonstrate its capacity to do the unusual. Indeed, it has demonstrated that it cannot even drift with the tide, but that it is a laggard in the industry.

On the other hand, should a company with only $100,000 of capital show a profit of $100,000, and assuming that there has been no accidental cause aside from good management for such profit, then the salary of the management of the small company, if placed at $50,000 a year, would not be excessive. Such management would have demonstrated its ability to have made 100% upon its original investment before management salary charges, and 50% for the stockholders after salary charges. No stockholder should complain about paying management $50,000 a year if management could make, after such payment, 50% upon each invested dollar for the stockholders.

Earnings in a measure denote leadership. I do not say that they are the entire answer to leadership, but they have a very definite value as indicating leadership. During these years there has been much criticism of some of our business leadership; whether this criticism is properly founded or not it is a fact there has never been a sound method of getting at business leadership.

Recently a man, high in public affairs, asked me whether I could name fifty business men who might represent the business leadership of this nation. My reply was that he might not know any of the fifty if I did name them. He asked how I would reach my conclusions. My answer set forth the following program:

First, I would want to make a survey of the corporate and partnership income tax returns of the nation for these depression years.

Secondly, I would select one hundred of the best returns on capital employed in business, eliminating the very small business return let us say of earnings less than $50,000.

I would next consider the causes of the unusual performance by these one hundred organizations. If I found the businesses to be stable and that the earnings had been made through ingenious management, and not as the result of some accidental occurrence, I would then narrow down and select fifty who had given the best performance.

Those fifty names, I venture to say, might hardly be known, yet to my mind they would represent the real potential business leadership of this country. This thought, applied for the discovery of leadership, might so aid recovery that such uneconomic philosophies as no-profit theories would never be put forward.

CASH FOR CARE

(Continued from page 1)

over $5,000,000. Since the state is to pay half of this amount, the cost would be over $2,500,000 per year, or $5,000,000, for the biennium. It should be remembered that the federal bill to which any state legislation must conform, if enacted into law, provides as well for compulsory contributory annuities and for voluntary contributory annuities. You will see estimates of the cost of these three phases of the bill. Any estimates of total cost will probably be as far out of line as are the estimates of the cost of the non-contributory section of the legislation.

The Manufacturers' Association of Connecticut will not oppose old age pension legislation of a type which will not wreck the state and its citizens financially. The hope of the directors and members of the Association is that the good judgment which the Connecticut General Assembly invariably evidences will not be lacking when it considers the substitution of cash for care.

NEWS FORUM

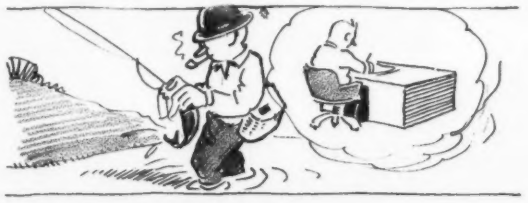
Election at American Hosiery. At a recent meeting of the board of directors of the American Hosiery Company of New Britain, Conn., F. Chase Coale, former vice-president and sales manager, was elected president. Mr. Coale has been with the company continuously since 1896. Other officers elected were: L. H. Taylor, secretary and treasurer; R. C. Lyman and R. W. Whitman, vice-president; E. H. R. Vogel, assistant treasurer and assistant secretary. Mr. Taylor will continue to act as credit manager and Mr. Lyman and Mr. Whitman will be in charge, respectively, of plant and manufacturing and of general sales.

* * *

Federal Cutlery Locates in Plainville. The Federal Cutlery Co. of Meriden, affiliated with J. Bush, Inc., New York City, and has recently taken over the greater portion of the Edwin Hill factory on South Washington Street, Plainville, Conn., moving there in January.

* * *

Putnam Finishing Company Changes Hands. The Putnam Finishing Co. which occupies a section of the Uncas mill at Mechanicsville, Conn., has recently been purchased by E. Mittelholzer, a New Jersey manufacturer. The new owner will occupy about 400,000 feet of floor space and will enage in the finishing of cotton, silk and rayon fabrics.



Flynn Retires at Rossie Velvet. Peter Flynn recently retired as mill manager of the Noank plant. He had been with the company for 23 years, entering its employ in 1912 as assistant superintendent. Later he became superintendent and in 1930 he was made general manager. Honoring his retirement, a committee called at his home with gifts from officials and employes of the company.

"Insilco" Opens New Institute. The International Silver Co., Meriden, has just recently opened a new Sales Service Institute in the former Barbour Silver Company plant on Colony Street. The Institute, designed to serve as a permanent exhibit of all "Insilco" merchandise as well as a training school for dealers and salesmen, occupies 20,000 square feet of floor space. It was designed and executed largely by K. N. Whatmore, formerly of International's Canadian subsidiary and he is now its director.

All display features as well as the decorations in the Institute are of such artistic quality as to call for the full strength of Webster's superlatives in any attempt to describe them. At the preview, held in December 12, for the benefit of representatives of nearly one hundred national magazines, President Clifford R. Gardinor and Mr. Whatmore emphasized the thought that the Institute was primarily intended to demonstrate the craftsmanship of the Company's silversmiths, with the commercial angle taking second place. The Institute, with its reception room, auditorium and "hospitality" room are now open to the public. Views of certain displays in the Institute will in all probability appear in these columns in either the March or April issue.

* * *

Wallace Barnes Boosts Capital. The Wallace Barnes Company, spring makers of Bristol, Connecticut, recently increased its capital from $2,040,000 to $2,500,000 and the number of shares from 20,400 to 25,000 common stock, now with a par value of $100.00. Another recording shows its subsidiary company, the Dunbar Brothers, of Bristol, has increased its capital stock from $150,000 to $250,000 with a share increase of from 1,500 to 2,500, common, with a par value of $100.00.

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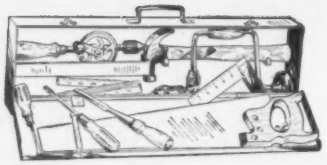
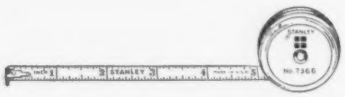


Two New Stanley Products. The Stanley Works, referred to in the trade as Stanley Tools at New Britain, Conn., now offers an exceptional merchandising value of genuine tools, packed in a metal box and offered in two assortments—one No. 882 consisting of nine tools and another No. 882A of ten tools. Lacquered green, the all steel tool box measures 24¾ inches by 3½ inches by 7 inches and is equipped with a hinged panel, hooks and compartments for tools, two catches and a carrying handle. The tools packed in this box are Stanley Defiance Tools, long recognized by the trade as practical, dependable and attractive.



The other new product is a flexible-rigid steel rule, smaller than a watch, which combines novelty with beauty and efficiency. This new item, known as "Tru-Tape," is a handy and useful item not only for contractors, lumber dealers, architects, etc., but also for householders and women as a unique bridge prize. The rule case is beautifully finished in satin and chromium plate, with red Four Square and black enamel filled design. Enclosed in a case 1⅝" in diameter is a six foot blade of fiexible-rigid steel, nickel-plated and graduated on both edges. The action of the blade is of the "Pull-Push" type. The retail price of the item packed in a modern gift box is $1.50.

* * *

Council Committee Adopts Program. Meeting late in December, the New England Council Executive Committee together with other New England leaders adopted a program for 1935 consisting of eight points as follows:

1. Labor Relation; 2. Recreational Development; 3. Public Expenditures; 4. Study of Industrial Relations; 5. Farm Marketing; 6. Public Services; 7. Administration Contacts; 8. Each state lay out principles for its own activities.

Throughout the meeting, as described by Willard B. Rogers, member of the Executive Committee, the general feeling was towards the adoption of a constructively offensive policy in all governmental matters rather than a combative defensive one.

* * *

New Britain Against Light Plant. The common council of New Britain recently adopted the report of its special sub-committee which disapproved the expenditures of approximately $6,000,000 for the construction of a municipal light plant. At the same time was accepted the offer of the Connecticut Light and Power Company to re-light all of the street lights now extinguished, at one-third of the regular rate.

State Large Process Tax Contributor. Tax figures recently issued show that Connecticut has contributed more than seven times as much in processing and related taxes as it has received in rental and benefit payments through the A.A.A. farm program. Collections from Connecticut total $2,455,-132 through October 31, as compared with rental and benefit payments paid to Connecticut farmers aggregating $320,561.85. Leading the list of commodities upon which a processing tax was paid is cotton, paying $1,883,255. Taxes paid on other commodities were as follows: Wheat, $108,051; hogs, $405,866; tobacco, $34,641; paper and jute, $6,095; field corn, $2,257; and sugar $4,964.

* * *

Death of G. M. Bond, Inventor. George Meade Bond, 82, of Hartford, widely known as an inventor and an authority on standardization of measurements, died at his home on January 6th after a long illness.

Mr. Bond had lived in Hartford for 54 years, entering the employ of Pratt and Whitney Company in 1880, after his graduation from the Stevens Institute of Technology in that year. He had entered the service of the Pratt and Whitney Company to direct the building of the comparator, a device de-

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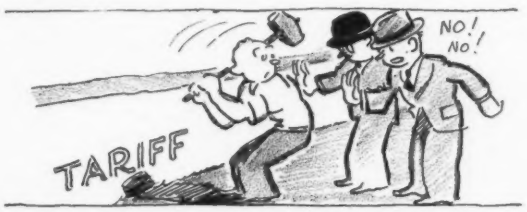
signed during his senior year at college which enabled astronomers to conduct investigations more efficiently in standards of lengths.

Mr. Bond was manager of the standards and gauge department of the Pratt and Whitney Company until October, 1902, during which period he designed and the company produced a line of cylindrical, caliper, swap, limit, thread, and other gauges which have since been in common use throughout the country. He also designed the Bond standard measuring machine which made it possible to make gauges to a given size and to reproduce them to exactly the same length or diameter, no matter how many years later duplicates were made. His achievements were largely responsible for making this system of interchangeability of parts practical.

* * *

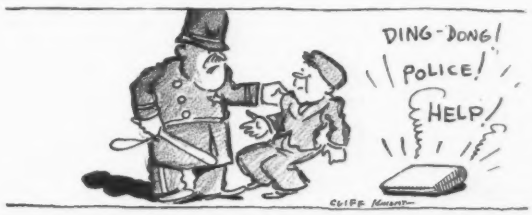
Winsted Firm Rewards Workers. The Winsted Hosiery Company distributed just before the Christmas holiday $12,000 to 80% of the company's personnel, or between 200 or 250, who have been working on shortened schedules or have received less money during the year because of the general business conditions. The money is said to have been paid from the Company's reserve funds rather than from profits of 1934 business.



Tariff Slashes Opposed by Two Industries. R. H. Whitehead, president of the New Haven Clock Commission on December 17 against any reducindustry on record before the United States Tariff Commission on December 17th against any reduction of tariff rates on clocks in reciprocal tariff bargaining with Switzerland. Mr. Whitehead pointed out that the financial disasters to the domestic clock industry have recently resulted in government loans to two companies, and the necessity for additional outside capital to be furnished another large industry to enable them to survive. He advised the Commission that the industry was slowly emerging from a depression, but that a reduction of the tariff schedule would again plunge it back into its former difficulties. Mr. Whitehead reflected the views of his own company, the Sessions Clock Company of Forestville, the Ingraham Company of Bristol, the Seth Thomas Clock Company of Thomaston, Gilbert Clock Company at Winsted and the Waterbury Clock Company of Waterbury.

Two other Connecticut companies, the Ensign-Bickford Company of Simsbury and the Stamford Rubber Supply Company of Stamford, were parties to briefs protesting the use of the chemical industry as a sacrifice in trade bargaining with Switzerland. Francis P. Garvan, president of the Chemical Foundation, Inc., spoke in behalf of these and other companies associated with the chemical industry. He held the airplane and chemical industries as the greatest anti-war devices on earth, stating that war is over for any nation whose peace-time airplane industry and peace-time chemical industries lead the world.

Ensign-Bickford Aid New Burglar Protector. The Ensign-Bickford Co., of Simsbury is now participating with the Bankers' Protective Company, in a new type of thief-proof bag for carrying valuables. The bag looks like any well-made bag of expensive leather, but contains within it an ingenious mechanism that shoots off four blank cartridges within ten seconds after the bag is snatched from the hands of its carrier, and thereafter begins to pour forth clouds of dense and suffocating smoke, making the thief an unpleasantly conspicuous object and an easy target for police.



When the bag is yanked away or falls from the messenger's hand, a small inconspicuous bit of wire with a loop remains on the finger of the messenger, leaving the bag locked and ready to operate the protective mechanism. Experiments have shown that the unpleasant nature of the smoke would force a man from an open automobile in less than a minute, and even though he held onto it thinking to slash its sides and take the money, he would be frustrated because of its wire mesh construction.

Eventually, if sales justify, headquarters of the Bankers' Protective Company, in which Ensign-

Recording Thermometer, Model 40M

TRADE MARK
BRISTOL'S
REG. U.S. PAT. OFF.

Instruments for Indicating Recording Controlling Since 1889

THE BRISTOL COMPANY
WATERBURY-CONNECTICUT

Process Cycle Controller, Model 6035

Bickford is interested, will be moved to the latter's plant in Simsbury and Connecticut workmen used for the manufacture of the entire product.

* * *

Insured Loans Sought for Industry. Officials of the Federal Housing Corporation are said to be working on proposed new legislation to give industry insured loans for the purchase of up-to-date machinery. Officials, who refuse to be quoted by name, contend such legislation would give a potential outlet of from 3 to 4 billion dollars of steel, iron and other capital goods, all accomplished by a simple change in the Housing Act. Plant modernization loans under this proposed legislation would be handled by the housing corporation and these mortgages given the same discounting outlet that is now being contemplated for housing mortgages.

* * *

A Britisher Comments on the Nye Inquiry. A British magazine published in Middlesex, England, known as The Bare Aspect, recently published the following: "Whatever else it may achieve the American Inquiry will have one concrete result. It will fairly alarm foreign purchasers of munition who not unnaturally object to having their business broadcast for the benefit of ignorant and fussy senators. It will make them wary of placing munition orders in the United States."

* * *

Death of David R. Bowen. David Rees Bowen, vice-president of Farrel-Birmingham Company, Inc., and for forty-five years its chief engineer, died at his home at Ansonia, Conn., on Saturday, December 29. Born in Wales, October 22, 1865, Mr. Bowen received his early education in the British National Schools and at Llandovery Collegiate School. At 17 he came to the United States with his parents and in 1883 entered the employ of the Farrel Foundry and Machine Co. as a machinist's apprentice. After three years he entered the drafting room, making such rapid progress that within ten years he was appointed as Chief Engineer. In 1930 he was made Vice-President, in charge of engineering.

In 1933, ill health compelled him to give up active direction of engineering after which he remained as consultant and vice president until his death. His ability as an engineer exerted a marked influence on the design of machinery for rubber, linoleum, plastics, non-ferrous rolling mills, sugar cane grinding, stone and ore crushing, paper and others. Without exaggeration, it may be said that there is not a civilized country in the world where machinery of this type is used in which the influence of Mr. Bowen's sound engineering skill is not apparent.

Mr. Bowen was a member of the American Society of Mechanical Engineers, and was also affiliated with the Masonic order and with the Ansonia Lodge of Elks. He took a keen interest in civic and community affairs, serving as alderman of Ansonia and member of the board of trustees of the Ansonia Public Library. He was also a vestryman of Christ Episcopal Church. He loved books, and through them acquired a large fund of knowledge on many subjects. Surviving him are his wife, a son, a daughter and two grandchildren.

R. Wallace & Sons Mfg. Co. Celebrates 100th Anniversary. R. Wallace & Sons Mfg. Co. of Wallingford, Conn., silverware manufacturers, is this year celebrating its first century of existence, which started with the production by its founder, Robert Wallace, of the first German Silver Spoon made in America. Throughout its history the Company has been managed by Robert Wallace and his direct descendants, now being headed by Charles D. Morris, a grandson, an outstanding industrialist and financier of Wallingford. As a fitting climax to its first century in business, the Wallace Company has tripled its advertising schedule for 1935 and increased its sales force. Through the efforts of the management the R. Wallace and Sons Mfg. Co. has been successful in minimizing the business depression to its employees, as demonstrated by the fact that the high mark of employment in 1934 was 990 persons as against 960 employes at the high point in 1929.

In commemoration of its Centennial year, there was published in the Company's house organ of December 29, 1934, an editorial on "Restored Values —1935." For lack of space we quote from it in part as follows: ". . . A few fools have led us into the era of high finance, paper profits, big shot pomposity, and hunger for nation-wide enterprises—the era of mammoth 'mappetites.' This has rendered great 'soul-areas' arid, unable to bear the fruit of love. It has made family branches bare of the leaves of kinship each for the other. . . . But the roots of instinct are robust. They are reaching outward, toward the redeeming moisture of old truths, old values, old concepts of what makes the worthwhileness of life. We're commencing to cherish old friends, to treasure a good name, to respect business standing, and to desire permanence in our social and commercial relationships and affiliations. The house to which time has given endorsement, the business to which years have attached the credentials of sustained patronage, is commencing to benefit by the public eagerness to put confidence where it will not be betrayed. . . . "

TWO sides of the Hundredth Anniversary Medal, R. Wallace & Sons Mfg. Co., Wallingford, Conn.

DEPARTMENTS

Accounting Hints for Management

Contributed by Hartford Chapter N. A. C. A.

Selling Prices Under Varying Conditions. The present trend (tendency) in the realm of Code Administration is to abandon price fixing and to return this function to the individual manufacturer (producer). Undoubtedly the larger experience of a group, gathered from different parts of the country, would lead to more reasonable prices than those set by the single producer. Particularly is this true if the majority of the group are interested in obtaining as large a volume as possible with but a small profit per unit.

The Selling Price, Volume and Cost are related for the producer, while for the consumer it is Price, Volume and Purchasing Power. By the proper use of advertising more of the Purchasing Power of the consumer can be attracted to one particular article.

The problem, then, is to set a price which will result in the largest volume possible, and on the basis of that volume to provide enough revenue to cover the cost of manufacturing the article, plus the expense of selling and advertising, with a small margin for profit. Where there are several producers of a given article it is important not to overlook the fact that the volume will be shared, and one concern will not be able to hold a major portion for any length of time by a reduced price, particularly if the increase in volume is obtained by a reduction in that of competitors, rather than by an increase in the total consumption. This oversight led many into an era of "Volume at any Cost" not long ago, and a repetition thereof should be avoided in the future.

As all the elements in the problem are variable, the solution is not easy. First, an estimate must be prepared of the possible volume at a given price, with an allowance for advertising. Second, the portion of the total volume that the manufacturer can secure must be determined; and third, the cost should be calculated at that volume. If the article in question is already on the market, and standard costs are well developed, a practical method of determining the cost based on varying volume is that discussed by Mr. Eric A. Camman, National President of the Cost Accountants Association at a recent meeting of the Hartford Chapter.

In this instance the relation between the Standard Manufacturing Cost of the line of products and the corresponding Sales Amount is used. The expected change in volume is noted percentage-wise. The ratio of change in cost at the current period is determined, also the percent change in the contemplated selling price. Several practical formulae for determining the factors involved in the computations were discussed and illustrated by the speaker. The subject is covered at length in the N. A. C. A. 1934 Year Book. If the increase in volume is large, a new standard cost will first have to be prepared which will reflect improvements in methods due to the larger volume, before the change in costs can be determined.

Another method of determining if the Price and Volume contemplated will produce sufficient revenue, is to segregate the fixed and the variable portions of the cost. By determining the variable portion of the price, and then subtracting it from 100 percent, the portion which must cover the fixed expense, allocated to the article, is found. The Sales Amount then can be determined from the total amount of Expense. With such a large number of variables it is usually necessary to make a few computations before a price can be determined which will fill all the requirements.

* * *

Cost Accountants Bring Knoeppel to State. Hartford Chapter, N. A. C. A., has secured as the speaker for its monthly meeting February 19, 1935, C. E. Knoeppel, an industrial engineer of national reputation. His topic will be "Profit Control Budgeting." The meeting which will be held at the Elm Tree Inn, Farmington, is open to members of the Manufacturers' Association.

Transportation

Large Savings Seen in Car Pool. Plans for establishing a National Freight-Car Pool are understood to have been recently completed under the direction of J. J. Pelley, president of the Association of American Railways. In a study preceding the plan, the reason for the movement of every empty car in the country was determined. It is estimated that one hundred million dollars in annual savings will result from the inauguration of the pool.

* * *

Hearing on Loading or Unloading Charges. N. W. Ford, Traffic Manager of the Association, was present at the hearing held in New York, January 4, on a railroad proposal to make an additional charge of 2½ cents per cwt. for loading or unloading import, export, intercoastal and coastwise freight handled to and from piers, lighters or car-floats at North Atlantic Ports, when the freight is not transported under joint through rates with the water carrier from which it is received or to which it is delivered. Mr. Ford points out that because of the proximity of Connecticut cities to the ports of New York, Providence and Boston, maximum haul on this traffic is only slightly in excess of 100 miles, which results in comparatively low rates that are highly competitive with the motor truck. Because of this condition, he pointed out that the probable increase of from 10 to 20 percent, if applied, would probably cause diversion of considerable tonnage from the railroads to competing forms of transportation.

Due to the necessity of obtaining concurrence from the many other interested parties throughout

the United States and Canada, it is not expected that a decision will be reached for considerable time.

* * *

Injunction Granted Against Freight Handlers Union. Justice Burt J. Humphrey of the Kings County Supreme Court of New York, granted a permanent injunction against officials and members of certain labor organizations, as well as the majority of deep-sea and intercoastal steamship carriers, on January 2, 1935, preventing them from refusing to accept or deliver freight handled by non-union truck dirvers. About fifty labor unions and labor representatives as well as 52 steamship companies were defendants in the case which lasted nearly six weeks. During the trial, the defendant shipping companies professed willingness to receive freight or discharge freight to plaintiffs without discrimination, but claimed their employes refused to cooperate. The court's attitude was reflected as follows: "This (the refusal of employes to handle such freight) does not excuse them (the steamship company) from their obligation to the public as common carriers, and though they reluctantly accede to the demands of the Union, their failure to exact obedience from their own employes makes them co-conspirators with the labor union."

The decision is far-reaching and firmly re-establishes the right of industry to transact business and deliver its products, regardless of any union or non-union affiliations on the part of its employes. Copies of decision are available at the Association's Transportation Department upon request by members.

Foreign Trade

Russian Debt Accord Seen Nearer. The arrival of Ivan E. Boyez in the United States, on December 25, together with the arrival since mid-November of more than forty Soviet engineers and purchasing agents, has added much to the belief that a settlement of the U. S.-Russian debts dispute is imminent. Mr. Boyez was formerly a Vice Commissar of Foreign Trade and as chairman of the board of Amtorg, the Russian purchasing agency in New York, is in line to become trade commissioner in the United States as soon as a debt agreement has been reached.

The technicians recently arriving represent the following Soviet trusts: aviation, steel, automobiles, oil, tractors, railroads, hosiery and knitting, machine tools and heavy industry manufacturing equipment. It is known that numerous contracts, some running into millions of dollars, are now under negotiation, one of them being for construction of a steel rolling mill in Russia.

* * *

NRA Tariff Clause Invoked. Manufacturers have recently sought relief under Section 3(e) of the National Industrial Recovery Act by filing complaints with the Imports Section of the National Recovery Administration against the importation of thermostatic containers from Japan and Germany; horseshoes and mule shoes from Germany and the Netherlands, hemp halibut fishing lines from Norway and Italy; and jute webbing from most of the countries of Western Europe and British India.

Joining in the complaint entered by the Thermostatic Container Industry, a sub-division of the Fabricated Metal Products Industry, are Landers, Frary and Clark of New Britain, Conn.; the American Thermos Bottle Co. of Norwich, Conn., Manning-Bowman Co. of Meriden, Conn.; and Kimble Glass Co. of Wineland, N. J. These four companies represent approximately seventy-five percent of the industry.

Jacobs Chucks

A JACOBS CHUCK on a tool is like a "sterling" mark on a piece of silver —a mark which instantly identifies the tool as a thing of in-built quality.

THE
JACOBS MANUFACTURING COMPANY
HARTFORD CONNECTICUT

"YOUR SATISFACTION IS OUR SUCCESS"

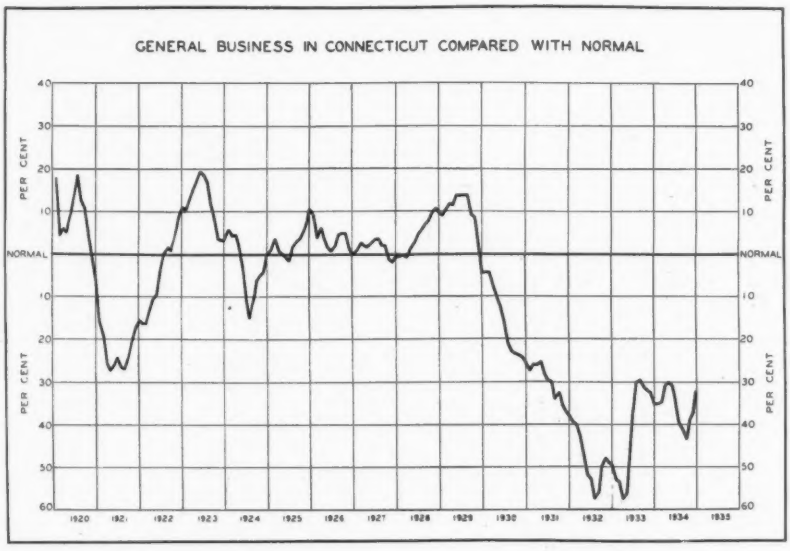
LUNHAM & REEVE
INCORPORATED

Foreign Freight Forwarders
Custom House Brokers
Highest Banking & Commercial References
World Wide Correspondents.

10 BRIDGE STREET NEW YORK

BUSINESS PATTERN

General Summary. During December, general business activity in Connecticut increased substantially, the composite index of business standing at 32.3% below the estimated normal compared with –37.3% (revised) in November and –35% in December, 1933. The advance was participated in by all but one of the components of the business curve, factory employment in two cities being nominally lower than a month earlier. On the other hand, the number of man-hours worked in five Connecticut cities increased 4.6% over November contrary to the usual seasonal movement and, in comparison with normal, equalled the previous 1934 high made in April. The rise was particularly significant since cotton also rose over the previous month. In the week ended January 5th the weekly business index of the New York Times continued its upward climb and reached the highest point since August, 1933. In the week ended January 12th steel ingot production and automobile production rose further indicating the probability of another increase in the weekly index. Automobile production was double the rate in the corresponding week of 1934 and at the highest level for that week since 1929. The present advance in general business activity seems on the whole to be genuinely encouraging because such factors as labor disturbances, the possibility of higher production costs and other abnormal factors



all cities for which data are available took part in it. Freight car-loadings originating in fourteen cities also expanded sharply, the usual year-end contraction being here, too, entirely absent. The volume of metal tonnage carried by the New Haven Road showed a decided advance over the preceding month while cotton textile mill activity and bank debits to individual accounts in three cities were moderately higher than a month earlier. Current reports for the first part of January indicate a further but less rapid expansion in general business activity.

In the United States, general business activity also experienced marked improvement in December. Large increases occurred in freight car-loadings, electric power production, silk consumption, steel ingot production and automobile production, the last mentioned advancing to 86% of the estimated normal in December from 44% in November. Pig-iron production and mill consumption of raw do not appear to be at the base of it.

The index of wholesale prices of the U. S. Bureau of Labor Statistics on January 5th was 1.5% higher than four weeks earlier due entirely to advances in the prices of farm products and foods. All other commodities during that period declined by somewhat less than one-half of one per cent. Farm products and foods rose approximately 5% due largely to substantial advances in the prices of cattle, hogs, and dairy products besides minor increases in wheat, corn and other grains.

Retail prices, with the exception of foods, underwent little change in December but the price of foods, particularly meats and butter, moved upward in the latter half of the month and in the first half of January.

Finance. The number of business failures and the net liabilities of failures declined 7% and 19%, respectively, in the four weeks ended January 5th

when compared with the corresponding period last year. On the other hand, the number of new corporations formed and the total amount of capital stock involved were approximately 40% higher. Real estate sales declined seasonally during the period but were 10% above a year earlier. The value of mortgage loans exceeded the previous year by 26%.

Construction. A seasonal decrease in new building took place in Connecticut during December but compared with December, 1933, the number of building permits issued increased 53% and the total value showed a gain of 60%. Nevertheless, the total value of building permits issued was still only 25% of the 1928-29 average. On January 12th work was begun on an addition to a factory building in Norwalk, the addition increasing the total floor space by 16,000 square feet.

In the United States, the value of building contracts awarded in December in 37 states declined 10% more than seasonally expected from November. New residential building fell off 21%, public works and utility projects increased 1% but other non-residential building receded 28%.

Labor and Industry. As mentioned above, activity in Connecticut manufacturing establishments expanded materially in December, the index of the number of man-hours worked in five cities standing at 31% below normal against 34% below in November and 36% below a year earlier. Large increases contrary to the seasonal trend were reported in factories in Bridgeport and New Britain where the number of man-hours was 3% and 5% above December, 1933. In Bristol and New Haven concerns activity also increased and was 8% above a year previous. Factory employment in ten cities was 0.2% higher than in November but in the two cities used in the general business curve and referred to above a decrease of 0.2% was indicated. In Torrington and Waterbury plants, employment was 3% above the level of December, 1933, and in Hartford plants, an increase of 11% took place during the year.

Preliminary information relative to changes in employment and payrolls in manufacturing establishments in the United States in December indicated that increases were experienced in both items when compared with November. This was due largely to the sharp expansion in activity in steel and automobile center.

Trade. Retail trade in the United States in December advanced to 76% of the 1923-25 average compared with 73% in November and was 11% higher than a year earlier. Stocks of goods on hand were less than last year and collections were reported to be improved.

Transportation. The index of freight car-loadings originating in Connecticut stood at 38% below normal in December against 46% below in November. The average daily car-loadings for the first five days of January were substantially higher than the December average.

1935—THE TERCENTENARY—1935

Connecticut invites to its Tercentenary celebration, this year, not only the citizens of other states, born or tracing their antecedents to the state, but citizens of all nations. Later announcements will tell of specific events.

STEPS FORWARD IN FORWARDING

Milton Snedeker Corporation

Foreign Freight Forwarders

Custom House Brokers

We handle shipments to and from all parts of the world.

Our service has met with approval of shippers throughout Connecticut and elsewhere—Let us serve you too.

44 WHITEHALL ST. NEW YORK CITY

DIPPING BASKETS

WIRE CLOTH

RUBBISH BURNERS

FIREPLACE SCREENS

MANUFACTURED BY

The JOHN P. SMITH Co.

425-433 CHAPEL STREET NEW HAVEN, CONN.

NEW HAVEN CONN.

CHUCKS

(Continued from page 8)

States or abroad. It has established a large number of dealer connections with mill supply houses throughout the United States and Canada and in every foreign country where drill chucks ars used. Many of the original dealer connections are still maintained.

Its merchandising policy has been unique. For instance, within recent years, it has advertised many of the products of its customers through full page ads in trade papers as well as advertising the various progressive developments in which electric drills (and incidentally Jacobs Chucks) played a prominent part. If one was to seek an outstanding example of a well-managed company with a good product, in which well-directed advertising played a prominent part in its success, he could find no better one than the Jacobs Manufacturing Company.

Present officials of the Company are: Louis E. Stoner, chairman of the board; Hubert M. Toppin, president and treasurer; G. A. Englund, first vice-president and factory manager; J. H. Hadley, vice-president and sales manager; A. M. Stoner, secretary; S. J. Drago, assistant treasurer; E. J. Stoner, assistant secretary; and A. E. Englund, production manager.

The D. E. Whiton Machine Company

This company was the outgrowth of the business started in Stafford by David E. Whiton in 1856, as previously mentioned. The third item in the line produced was gear cutting machines, originally developed by David Whiton and later by his son and present head of the company, Lucius E. Whiton. The latter entered the business shortly after completing a scientific course in 1881, and as he described "after having the time of his life on a three weeks' camping expedition in the Adirondack region around Lakes George, Champlain and other small lakes, with a group of his school associates."

Later in the fall of 1881, Mr. David Whiton was taken seriously ill, leaving full responsibility for the operation of the business in the hands of his son. So well did he conduct affairs that when David Whiton recovered, a partnership was formed, which led to incorporation in 1886, after the complete removal of the plant to New London that year. The gear cutting end of the business had been moved two years previous.

Today the company is housed in a large modernly equipped plant in which the major portion of the products produced are centering and gear cutting machines in many sizes and types. It also does a sizeable business in Lathe Chucks and a small business in Drill Chucks. According to our plan of classifying companies in the field which represents its largest percentage of production, the story of the D. E. Whiton Machine Company should logically appear later in the industrial series under the caption "Machine Tools". It is told here because of Mr. David Whiton's prominent association with the chuck industry in its cradle at West Stafford, Connecticut.

The present head of the company, Lucius E. Whiton, has won distinction as the designer of centering machines, gear cutting machines and chucks, having just recently discovered a way to increase many-fold the gripping power of chuck jaws. He has also served as representative from New London County in the Connecticut General Assembly.

E. Horton and Son Company

Few facts that can be substantiated regarding the details of the founding of this company, have been available to the writer, prior to press time. It is known, however, that E. Horton worked with Simon Fairman in West Stafford, Connecticut, later in 1851, starting his own shop in Windsor Locks to make a geared type Chuck, which he had patented, thus making it the second Chuck producing plant in the United States. The Horton plant proved to be a training school for Mr. James N. Skinner and others who later established themselves in the Chuck manufacturing business. Mr. Horton was succeeded as the company head by his brother-in-law and then his son. But within the past decade the management and control has passed from the Hortons to Mr. Joseph C. Regan.

FOR
70
YEARS

"THE CUSHMANS" have been making lathe chucks in Hartford. Chucks with the CUSHMAN STAMP are known throughout the world and are universally held to be a

STANDARD FOR EXCELLENCE

"CUSHMAN"
CHUCKS
1862

THE CUSHMAN PRODUCT

comprises Lathe Chucks for every purpose and of both hand and power-operated types; also Power Units and Power Wrenches, electrically motored.

THE CUSHMAN CHUCK COMPANY
HARTFORD, CONNECTICUT, U. S. A.

SERVICE SECTION

On account of space limitations, the material and used equipment items offered for sale by Association members have not been classified by sizes or usage best adapted. Full information will be given on receipt of inquiry. Listing service free to member concerns.

●● Materials for Sale

COLD rolled steel in coils and in squares, condulets and fittings, remnants of covering materials—velours, velvets, mohair, tapestries, denims, chintzes, and cretonnes, semi-finished and castellated U. S. S. nuts, pulleys, flat and crown face-steel and cast-iron; new shaft hangers, brass wire, brass rods, aluminum tubing, cold drawn steel—mostly hex; miscellaneous lot of material used in the manufacture of molded rubber parts and flooring, knife switches—new and many sizes; carload C. I. drop bases; lead pipe, lead sheet, acid proof pipe fittings, 124 bars screw stock varying thicknesses and lengths, white absorbent tissue process from cotton, rotary convertor, colors and dyes—large variety, lacquers—several hundred gallons in assorted colors; and soft anneal copper with high silver content in rolls. J. H. Williams wrenches in assorted sizes.

●● Equipment for Sale

ACCUMULATORS, annunciators, baskets, beaders, beamers, bearings, belt stretchers, blowers, boilers, braiders, bronze runners, cans, cards, woolen; car loaders, chain, chairs, chamier, clocks, time recorders; clock systems, colors and dyes, compressors, condulets, convertors, conveyors, cookers, cooking utensils, doublers, draftsman's table, drop hammers, drops, board; drums, drying racks, dyes, engines, evaporators, extractors or percolators, fans, filtering carbon, folders, forming rolls, frames, furnaces, gears, generators, grinders, grindstones, grinding wheels, guiders, headers, lamp shades, lathes, lifters, looms, De Laski circular; machines, automatic; machines, calculating; machines, compressing; machines, dieing; machines, drilling; machines, filing; machines, filling; machines, folding; machines, knitting; machines, mercerizing; machines, milling; machines, pipe-cutting and threading; machines, pleating down; machines, riveting; machines, screw; machines, threading; machines, tongue and groove; machines, washing; mercerizer equipment; millers, mixers, mills, mills rubber; mixing rolls, motors, oil circuits; oven drawers, paints and lacquers; panels, planers, plungers, pointers, presses, profilers, pulley drives, pumps, reamers, receivers, rheostats, safe cabinets, saws, scales, screens, seamers, shapers, shears, spindles, spinning mules, steam tables, steam warmers, stitcher, 192 monitor corner box switches, tables, tanks, toilet equpiment, trucks, ash can; tube closers; wire, wire screw and yarders.

●● For Sale or Rent

FOR SALE. One 3½ Bliss toggle press in good condition. Address S. E. 76.

FOR SALE—1 Brush expander for cleaning 3″ tubes; 1 Clinker Rake; 2 Straight Bars; 3 Valve Forks; 1 Stice Bars; 1 Fire Hoe; 1 Large 60 lb. gauge; 1 Large 180 lb. gauge; 1 Small 200 lb. gauge; 2 #5 Bigelow H.R.T. Boilers with overhanging fronts, 53 BHP, 526 square feet of water heating surface, 48″ D, 13'2″ long, 50—3″ tubes 12' long; 33, 3″ x 14″ Boiler tubes; 2, 4″ Gate Valves; 2, 4″ Non-Return Valves; 2, 3″ Pop Valves; 2 Water Columns Complete with Valves—but no glasses; 2, 2″ Blow-off Valves; 3, 1½″ Check Valves; 2, 1½″ Gate Valves; 1, 1¼″ Check Valve; 3, 1¼″ Gate Valves; 1, 1¼″ Globe Valve; 2, ¾″ Globe Valves; 2, ¾″ Gate Valves; 1, ½″ Globe Valve; 1, 2″ Check Valve; 1, 2″ Gate Valve; 2 complete sets of ash and firedoors with rings and mountings; 2 cast breeching connections (to fit front of boiler); 2 cast arches. Address S. E. 79.

FOR SALE—Free Cutting Bessemer Screw Stock of various sizes ranging from 7/16″ to 5″ in Rounds; 1⅛″ to 1½″ in Squares; and ⅞″ to 2″ in Hexagons. Also Cold Rolled Steel ½″ x ⅛″ to 3½″ x ¼″. Address S. E. 80.

FOR SALE. One N. C. Grindstone 72″ diameter x 12″ face, brand new and offered for sale at reasonable price by company which has discontinued use of grindstones. Address S. E. 86.

●● Wanted to Buy

WANTED, USED—1 Portable Recording Wattmeter, 3 Phase, 3 Wire, 60 Cycles, 230 and 575 Volts, 5 Amperes, Synchronous Motor Drive (1″ per hour and 1″ per minute suggested); 2 Current Transformers for above, 20-25-40-50-800-1,000 Ampere Rating; 1 600-KVA, 440 Volt, 3 Phase, 600 RPM Alternating Current Generator, with Exciter; Exciter preferably directly connected to Generator. Generator must have amortisseur windings. Address S. E. 87.

●● Employment

GRADUATE CHEMIST—TEACHER OF MATHEMATICS AND SCIENCE—ECONOMICS. Has done work on fats, oils, asphalts and bitumens, textiles and textile chemicals, impregnating treatments, rubber, water sewage, industrial wastes and inorganic analyses. Is willing to do anything. Age 41. Married and has a family. Address P. W. 267.

YOUNG COLLEGE MAN. Graduate of Trinity, B. S. degree with one year in Michigan Law School, who for financial reasons cannot continue in college, desires to locate position with manufacturing or commercial organization. Has had some banking and shipping experience during vacation periods. Starting salary desired nominal. Opportunity for development and advancement chief desire. Address P. W. 273.

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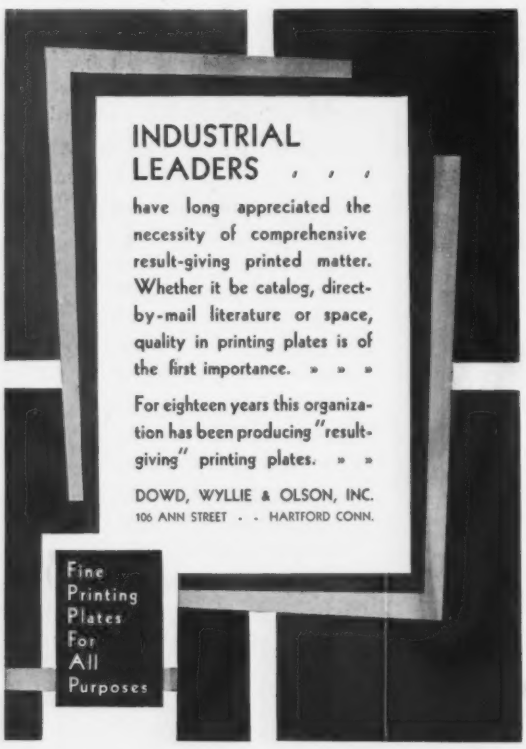

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